THE appointment of the Rev. T. W. Sharpe, C.B., to the Principalship of Queen's College, London, should have a decided influence upon the work of the College. Mr. Sharpe has just retired from the post of senior chief inspector and head of the administrative division of the Education Department, so he takes with him to Queen's College a wide knowledge of the principles and practice of teaching.

A USEFUL list of the current scientific serials received in Manchester, with an indication of the various libraries in which they are to be found, has been compiled, under the direction of Dr. W. E. Hoyle, by Mr. C. W. E. Leigh, and published by the Manchester Literary and Philosophical Society. The periodicals are arranged geographically, according to their place of publication. The list will doubtless prove of great service to workers in Manchester and the neighbourhood, and thus assist in the progress of science. It is believed to be the first of the kind published in England; but it is to be hoped that similar lists will be published for the use of students of science in other great cities.

SIR PHILIP MAGNUS distributed the prizes at Sexey's Trade School, Bruton, Somerset, on December 17. Alluding to prospective legislation in the direction of secondary education, he said that the County Education authorities had done their work well, and trusted there would be no rivalry between them and School Board authorities, as it would involve a risk of setting back the educational clock for many years. He pointed out the advantage of teaching a boy the manipulation of a balance and the use of tools, and attached great importance to the study of English literature. He was glad to find the school providing satisfactory scientific education in a rural district, thus embodying ideas which he had been advocating for twenty years.

IN the course of an address to the members of the Yorkshire Naturalist Union at Scarborough, on Saturday, Prof. Michael Foster, the retiring President of the Union, urged upon his hearers the great necessity of co-operation in science. All the earlier naturalists, he said, sought to solve the problems which every form of life possessed. Nature was the naturalist's teacher, and the field his laboratory. It was useless to try to stop the tide of differentiation that seemed to be creeping over the scientific world. That must go on. Still, they must look for help to go forward, not backward. Prof. Foster criticised the method of teaching science in the schools, and condemned the examinations often held as prejudicial to the development of science. The minds of students were very often pushed on by compulsion and drawn on by rewards, and no encouragement was given to them to look at nature in the fields and receive from her lips the catholic teaching which she alone could give. Such naturalists as they hoped to rear must be reared apart from the schools.

THE following gifts to educational institutions in the United States are announced in *Science*:—The Lawrence Scientific School, Harvard University, has received 10,000 dollars from Mr. J. H. Jennings, for the establishment of a scholarship.—Mr. James Stillman, of New York, has given 50,000 dollars to Harvard College to cover the cost of land and buildings for a projected Harvard Infirmary, which will bear the name of the donor. In addition, Mr. Stillman will contribute 2500 dollars annually for four years.—The will of the late Charles P. Wilder, of Wellesley Hills, bequeaths 102,000 dollars to Mount Holyoke College, and the trustees of Wellesley College announce a gift of 50,000 dollars made by Mr. Wilder before his death. No conditions are attached to the gift.—The Catholic University of Washington has received the information that by the will of Daniel T. Leahy, of Brooklyn, it receives 10,000 dollars.—The University of Cincinnati has been presented by Mr. William A. Proctor with the library of Mr. Robert Clarke, containing 6704 volumes valued at over 50,000 dollars.—A fund of 100,000 dollars is being raised by the trustees and friends of Oberlin, the income from which is to be applied to the reduction of the term bills of needy students. About one-tenth of this amount has already been collected.

THE system of payment by results of examinations, which the Intermediate Education Board for Ireland still uses in distributing its annual income of about 80,000*l.*, is made the subject of criticism by Dr. Gerald Molloy in an article reprinted from the *Irish Ecclesiastical Review*, and suggestions are made as to a general policy of reform. The following statement of facts from the article points unmistakably to the need for the reform which must soon take place:—In a memorial addressed to the Lord Lieutenant of Ireland last June, the Council of the Royal Dublin Society called attention to the way in which the teaching of science, in the intermediate schools, has been "practically exterminated" by the operation of the present system. From this paper it appears that the total number of boys that presented themselves for the examinations of the Intermediate Education Board, in the years 1887 and 1888, and the numbers that presented themselves in the subjects of natural philosophy and chemistry were as follows:—

	Total number	Nat. Philosophy	Chemistry
1887	4613	2611	1376
1888	4551	2565	1357

But, after the lapse of ten years, it is found that while the total number of boys presented for examination had considerably increased, the number presented in these two subjects had dwindled down almost to insignificance. The figures are:—

	Total number	Nat. Philosophy	Chemistry
1896	6503	618	359
1897	6661	596	312

It would seem, therefore, that something has occurred in the working of the system, during the last ten years, which has practically killed the teaching of these two important subjects in the intermediate schools of Ireland. The teaching of natural philosophy has fallen from 56 per cent. of the total number of boys presented for examination to somewhere about 9·2 per cent., and the teaching of chemistry has fallen from 30 per cent. to 4·6 per cent.

SCIENTIFIC SERIALS.

American Journal of Science, November.—Irregular reflection, by C. C. Hutchins. A carefully prepared surface of plaster of Paris, and a deposit of magnesia upon zinc, approximate very closely to Lambert's law of diffused reflection. A plaster disc cut into fine vertical furrows shows a considerable departure from the cosine law. A sphere prepared by coating an ivory ball in the flame of burning magnesium follows Lambert's equation very closely. The reflection measured is that of the total energy, observed with a thermograph and galvanometer.—Separation of nickel and cobalt by hydrochloric acid, by F. S. Havens. Pinerua's process for separating nickel and cobalt, which is analogous to the author's method of separating aluminium and iron, will not give a complete precipitation of the nickel chloride. Nickel chloride is, however, practically insoluble in pure ether saturated with HCl gas, and can be separated from small quantities of the soluble cobalt salt in that medium.—The value of type specimens and the importance of their preservation, by O. C. Marsh. The origin of mammals, by the same author. These two papers were read before the Cambridge International Zoological Congress, in August last.—Causes of variation in the composition of igneous rocks, by T. L. Walker. The author reviews briefly the more common theories advanced to explain the phenomena of variation in the composition of igneous rocks from border to centre or from top to bottom, and calls attention to the part which gravitation seems to play in causing heterogeneity in eruptive rocks. Some homogeneous salt solutions, if allowed to remain at a constant temperature for a long time, become gradually more concentrated in the lower strata. It is very probable that similar concentration occurs in complex silicate magmas, particularly near the temperature of solidification. An eruptive magma would therefore tend to become acid above and basic below. In the upper horizons of the eruption there would be a gradual increase of acidity towards the centre, since the outer and more quickly cooling portion would have no time to become differentiated by gravitation. The lower portions would show an increased basicity towards the centre. This is all in cordance with observed facts.—The relation between structural and magneto-optic rotation, by A. W. Wright and D. A. Kreider. Experiments on the crystallisation of various substances in a magnetic field show no indisputable evidence of the influence of the field upon optically active structure. In the case of sodium chlorate, there seems to be a preponderance of optically active crystals when deposited in a magnetic field, but these are right-handed or left-handed in about equal proportions.

Wiedemann's Annalen der Physik und Chemie, No. 11.—Electric dispersion in organic acids, esters, and glass, by K. F. Löwe. Drude's rule, that anomalous electric dispersion is always

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accompanied by anomalous absorption, receives a negative confirmation in the esters of the fatty acids and benzoic acid, which show neither. Other esters and alcohols show a rough approximation to Drude's formula. In the glasses, the relation between absorption and dispersion is undefined.—Limits of the solid state, by G. Tammann. Ostwald considers it possible that the transition from the liquid to the crystallised state takes place continuously along a Thomson-van-der-Waals isothermal. The author shows that this assumption implies the possibility of four volumes at the same pressure, and that the liquid isothermals may be followed up beyond the point of intersection with the crystal isothermals. This eliminates what Ostwald calls the meta-stable phase of crystallisation.—Contact electricity between metals and liquids, by A. Heydweiller. The author introduced minutely sub-divided metals into a narrow tube containing an electrolyte, and passed a current through the latter. Any contact electrification was then indicated by motion of the particles. He thus tested Coehn's rule, according to which bodies with a higher dielectric constant are positively charged by contact with bodies of a lower dielectric constant. Platinum, gold, tin, and other metals, immersed in various mixtures of water, chloroform, and acetone, show an agreement with Coehn's rule, but not when immersed in alcohol.—Use of a vacuum tube for thermal insulation, by A. Weinhold. In connection with d'Arsonval's claim of having employed the principle of Dewar's double bottle in 1887, the author mentions that he described the same apparatus as long ago as 1881, in the first edition of his "Physikalische Demonstrationen."

THE current number of the *Izvestia* of the East Siberian branch of the Russian Geographical Society contains several valuable papers.—M. Prein gives a list of 424 phanerogam plants collected in the west of the northern parts of Lake Baikal, and his list contains several species which are new for this interesting region.—A paper by S. V. Yastremski, on the ancient beliefs of the Yakutes (who belong to the Turkish stem), not only shows that their religion has a good deal in common with the religion of the Mongols, but also reveals traces of a worship of good-willing deities, which worship was practised by so-called "*white shamans*" (the *shaman* is the witch-priest). Traces of this worship, which has been intermingled in recent times with Christianity, are now found in epical poetry and popular songs only, but "white shamans" were known to exist not further than ten years ago. At the present time the "black shamans," or worshippers and conjurers of the bad-willing deities only, are retained.—M. S. Peretolchin gives an account of his ascent of the Munku-Sardyk peak in the Sayans, and describes a small glacier on its southern slope, surrounded by old moraines testifying to its former greater extension. Phanerogams were found up to an altitude of 10,230 feet.—N. A. Witaszewski gives interesting copies of inscriptions on the crags of the Olekma.—All papers are summed up in German.

IN the *Journal of Botany* for November and December, Col. H. W. Feilden continues and concludes his list of the "Flowering Plants of Novaya Zemlya," &c., 195 species in all, besides four Vascular Cryptogams.—Mr. E. S. Salmon describes and figures a moss new to the British flora, *Catharinea tenella*, lately found in Kent.—Messrs. H. and J. Groves describe and figure another very interesting addition to the British Cryptogamic flora, *Nitella hyalina*, discovered in Cornwall, one of the most beautiful of the Characeæ, distinguished from other species of the genus by the presence of secondary branchlets.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 24.—"On the Condensation Nuclei produced in Gases by the Action of Röntgen Rays, Uranium Rays, Ultra-violet Light, and other Agents." By C. T. R. Wilson.

By means of expansion experiments the degree of supersaturation necessary to cause water to condense on nuclei from various sources was determined. The nuclei produced in air or hydrogen by Röntgen rays or Uranium rays, or by the discharge of electricity from a pointed platinum wire, or by the escape of negative electricity from a zinc plate exposed to ultra-violet light, all require the same expansion ($v_2/v_1 = 1·25$, corresponding to a fourfold supersaturation) in order that water may condense on them. In moist air or oxygen exposed to ultra-violet light, nuclei are produced throughout the volume of the gas exposed to the rays; when the radiation is weak, these require as great a degree of supersaturation as the various nuclei above mentioned in order that water may condense on them; but with stronger radiation they appear to grow, and the expansion required to make water condense on them then depends on the intensity of the ultra-violet light, and on the time for which the gas has been exposed to the rays before expansion. With very strong ultra-violet light the growth of the nuclei continues even in unsaturated air till they become visible as a fog. Sunlight produces in air nuclei resembling those produced by weak ultra-violet light. Certain metals in contact with moist air produce nuclei always requiring great supersaturation in order that water may condense on them. This effect is most strongly exhibited by amalgamated zinc, with which comparatively dense fogs may be obtained on expansion.

It was found that the nuclei produced by X-rays or Uranium rays may readily be removed by applying an electric field, showing that the nuclei are identical with the ions to which the conducting power of the gas when exposed to the rays is due. Similar experiments with the nuclei produced by the action of ultra-violet light on moist air, and with those resulting from the presence of metals, showed that such nuclei do not move in an electric field. This is in agreement with the absence of conducting power.

Royal Microscopical Society, November 16.—Mr. E. M. Nelson, President, in the chair.—The President read a paper describing a very large and elaborate binocular microscope possessing many original features; it was designed and made some years ago by a friend. The description was illustrated by an excellent photograph of the instrument shown upon the screen.—Mr. Beck exhibited two slides of *Amphipleura pellucida*, mounted by Prof. Hamilton Smith in his high refractive medium; they were shown under $\frac{1}{12}$ achromatic oil immersion objectives of N.A. 1·0, and 1·25, the diatoms under the former showing re-solution very fairly, bur those under the latter were re-solved most satisfactorily.—Mr. Michael called attention to the slides of diatoms mounted in high refractive media, which Mr. Curties had brought for exhibition.—Dr. Hebb said there was a paper contributed by Mr. A. W. Waters, "on Bryozoa from Madeira," of which he gave a short *résumé*. Mr. Michael remarked that a systematic paper such as this would prove of considerable value to those who were studying the subject. Mr. Waters was at the present moment the best English authority on the Bryozoa, and their knowledge of these organisms had been systematised and made available largely by his contributions to the subject and by his skill as a draughtsman.

Mathematical Society, December 8.—Lieut.-Colonel Cunningham, R.E., Vice-President, in the chair.—Major Macmahon, R.A., F.R.S., communicated a discovery he had recently made in the theory of compound partitions.—Mr. J. E. Campbell read a paper on simultaneous partial differential equations.—The following papers were communicated in abstract: On hyperplane coordinates, by W. H. Young.—On a theorem allied to Laplace's, by Prof. W. H. Metzler.—Two problems of wave propagation at the surface of an elastic solid, by T. J. Bromwich. The two problems deal with the velocity of propagation of waves in hypothetical elastic solids. An attempt is made to find causes for the discrepancy between the observed velocities of earthquakes and those calculated by theory. The first case considered is that of a thin elastic shell (this case appears to have been solved by Lord Rayleigh, but it has not apparently been thought worthy of publication by him). The author finds that, with the elastic constants given by Prof. Milne as representing the nature of rocks at the surface of the earth, the deduced velocity has a value agreeing much more nearly with observed velocities than the velocity deduced from Lord Rayleigh's paper in the *Proceedings* (vol. xvii.). The second problem solves the hypothetical case of a thin skin fastened to the surface of a solid, the elastic constants of the two materials being supposed different. As might be expected the effect of the skin is not large, and the result only indicates that it is necessary to know the elastic constants at a depth comparable with a wave-length, before we can get a satisfactory comparison between theory and observation. Also by the same author, the influence of gravity on waves in an elastic solid, with especial

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